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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/520,678	03/07/2000	Michael Tipping	1018.093US1	9074

7590 06/17/2004

Law Offices of Albert S. Michalik
704-228th Avenue NE
Suite 193
Sammamish, WA 98074

EXAMINER

DAY, HERNG DER

ART UNIT	PAPER NUMBER
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2128

13

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/520,678

Applicant(s)

TIPPING ET AL.

Examiner

Herng-der Day

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-2, 4-11, 13-14, 16-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,2,4,5,10,11,13 and 14 is/are allowed.
- 6) ☒ Claim(s) 6,7,16 and 17 is/are rejected.
- 7) ☒ Claim(s) 8,9,18 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 March 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

1. This communication is in response to Applicants' Amendment (paper # 12) to Office Action dated September 5, 2003 (paper # 10), mailed February 26, 2004, and received by PTO March 1, 2004.

1-1. Claims 1, 10, and 13 have been amended; claims 3, 12, and 15 have been cancelled; claims 1-2, 4-11, 13-14 and 16-19 are pending.

1-2. Claims 1-2, 4-11, 13-14, and 16-19 have been examined. Claims 1-2, 4-5, 10-11, and 13-14 have been allowed. Claims 6-7 and 16-17 have been rejected. Claims 8-9 and 18-19 have been objected to.

Drawings

2. The replacement drawing sheet for amended Figures 2 and 3 received March 1, 2004, is acceptable.

3. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

Specification

4. The disclosure is objected to because of the following informalities:

Appropriate correction is required.

4-1. It appears that " $p(t|x)$ 304", as described in line 3 of page 11, should be " $p(c|x)$ 304".

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4-2. It appears that “the ψ function”, as described in line 12 of page 20, should be “the φ function”.

4-3. It appears that “relevance vector regression”, as described in line 6 of page 22, should be “relevance vector classification”.

Claim Objections

5. Claim 18 is objected to because of the following informality. Appropriate correction is required. As described in lines 2-3 of claim 18, “the set of predetermine additional parameters” (Emphasis added).

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 7 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7-1. Claim 7 recites the limitation “the prior distribution” in lines 3-4 of the claim. There is insufficient antecedent basis for this limitation in the claim. For the purpose of claim examination, the Examiner will presume that “the prior distribution” as described in lines 3-4 of claim 7 refers to “a prior distribution”.

7-2. Claim 17 recites the limitation “the prior distribution” in lines 3-4 of the claim. There is insufficient antecedent basis for this limitation in the claim. For the purpose of claim

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examination, the Examiner will presume that "the prior distribution" as described in lines 3-4 of claim 17 refers to "a prior distribution".

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8-1. Claims 6 and 16 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 21 of U.S. Patent No. 6,633,857 B1 in view of Bishop et al., U.S. Patent 6,556,960 B1 issued April 29, 2003.

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The conflicting claims are all directed to modeling a data set by determining a relevance vector learning machine, however, this instant application has an additional limitation “via a variational approach”. Bishop et al. disclose a variational inference engine for probabilistic graphical models, wherein variational inference, also referred to as variational methods, is a technique for approximating otherwise (usually) intractable probabilistic models (Bishop, column 5, lines 34-37).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Tipping’s relevance vector machine to incorporate the teachings of Bishop et al. because by using variational methods, those otherwise intractable probabilistic models can be approximated as Bishop et al. suggested.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 6 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tipping, U.S. Patent 6,633,857 B1 issued October 14, 2003, and filed September 4, 1999, in view of Bishop et al., U.S. Patent 6,556,960 B1 issued April 29, 2003, and filed September 1, 1999.

10-1. Regarding claim 6, Tipping discloses a computer-implemented method comprising:
inputting a data set to be modeled (a data set, column 9, lines 40-41);

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determining a relevance vector learning machine to obtain a posterior distribution for the data set (determining a relevance vector learning machine, column 9, lines 55-58); and,

outputting at least the posterior distribution for the data set for probabilistic prediction (at least the posterior distribution, as has been determined, is output, column 10, lines 16-17).

Tipping fails to expressly disclose via a variational approach. Bishop et al. disclose a variational inference engine for probabilistic graphical models (Abstract), wherein variational inference, also referred to as variational methods, is a technique for approximating otherwise (usually) intractable probabilistic models (Bishop, column 5, lines 34-37).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Tipping to incorporate the teachings of Bishop et al. to obtain the invention as specified in claim 6 because by using variational methods, those otherwise intractable probabilistic models can be approximated as Bishop et al. suggested.

10-2. Regarding claim 16, this machine-readable medium claim include identical method limitations as in claim 6 and is unpatentable using the same analysis of claim 6.

Allowable Subject Matter

11. Claims 1-2, 4-5, 10-11, and 13-14 are not taught by the prior art on the record and are allowed.

12. Dependent claims 7 and 17 would be allowable if rewritten to overcome the rejections under 35 U.S.C. 112, second paragraph, set forth in this Office action and rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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13. Claims 8-9 and 18-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants' Arguments

14. Applicants argue the following:

14-1. Prior Art Rejections

(1) Neither Matsumoto nor Simoudis, whether considered alone or in any permissible combination, discloses all the claimed subject matter (pages 10-19, paper # 12).

14-2. Non-statutory Subject Matter Rejections

(2) “applicants have amended claims 1, 10, and 13 to recite the additional limitation of ‘outputting at least the product approximating the posterior distribution for modeling of the data set’ or similar language” (pages 19-20, paper # 12).

Response to Arguments

15. Applicants’ arguments have been fully considered.

15-1. Applicants’ argument (1) is persuasive. The rejections under 35 U.S.C. 103(a) in paper # 10 have been withdrawn. However, upon further consideration, a new ground(s) of rejection is made. Claims 6 and 16 are rejected under 35 U.S.C. 103(a) as detailed in sections **10** to **10-2** above.

15-2. Applicants’ argument (2) is persuasive. The rejections of claims 1, 10, and 13 under 35 U.S.C. §101 in paper # 10 have been withdrawn.

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Conclusion

16. The prior art made of record and not relied upon is considered pertinent to Applicants' disclosure.


Reference to Bishop, U.S. Patent 6,671,661 B1 issued December 30, 2003, and filed May 19, 1999, is cited as performing a variational inference based on an approximation to the posterior distribution, using a factorized distribution.

17. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Herng-der Day whose telephone number is (703) 305-5269. The Examiner can normally be reached on 9:00 - 17:30.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kevin J Teska can be reached on (703) 305-9704. The fax phone numbers for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Herng-der Day
June 8, 2004


HUGH JONES Ph.D.
PRIMARY PATENT EXAMINER
TECHNOLOGY CENTER 2400